

INTEGRATING KNOWLEDGE AND PRACTICE IN CARDIOPULMONARY AND COMMUNITY PHYSIOTHERAPY: A PRACTICAL MODULE FOR PHYSIOTHERAPY STUDENTS.

Abstract

This chapter outlines the assessment including physiotherapy dimensions of Cardiopulmonary and Community Physiotherapy. This will enable physiotherapy students and practitioners with practical skill and clinical reasoning for effective physiotherapy and holistic care. The practical module also emphasizes the need for early detection, multidisciplinary intervention to address the challenges while implementing the physiotherapy care pathway. Objective and clinical skills to be demonstrated is stated with each case scenarios which will guide the learners.

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Part-II: Cardiorespiratory Physiotherapy and Community Physiotherapy

PRACTICAL MODULES

MODULES COMMON FOR ALL CARDIORESPIRATORY CONDITIONS

MODULE 1 - Case Study Analysis

SCENARIO

A case study of a patient with a respiratory disorder.

CLINICAL SKILLS TO BE DEMONSTRATED

- Identify impairments and functional limitations with ICF/CPG.
- Choose relevant assessment techniques and demonstrate their justification.
- Develop and demonstrate an evidence-based treatment plan that aligns with the clinical findings.
- Address contemporary breakthroughs in physical therapy interventions and their clinical applications.

MODULE 2 - Assessment Techniques

SCENARIO

A 65-year-old male patient diagnosed with chronic bronchitis has a smoking history, appears with a persistent productive cough and copious sputum during the last 5 months. He has been recommended for chest physiotherapy.

CLINICAL SKILLS TO BE DEMONSTRATED

- Select a method for assessing sputum classification and explain why you have chosen it.
 - Review the sputum analysis data to understand the patient's functional limitations and level of impairment.
 - Discuss how these results will impact treatment planning and development.
- Or
- Evaluate the patient's progress by using outcome measures like functional exercise capacity and levels of breathlessness.
 - Set SMART goals that align with the patient's priorities and the evaluation results.
 - Emphasize the importance of revisiting and adjusting goals throughout the rehabilitation process.

Module 3- Treatment Planning & Clinical Decision Making

SCENARIO

A 62-year-old man comes in with a persistent cough, shortness of breath, and dyspnoea during the last 12 months. He has been diagnosed with Emphysema, and has a history of smoking 40 packs a year. He reports exhaustion and finds daily tasks like walking or climbing stairs difficult.

CLINICAL SKILLS TO BE DEMONSTRATED

- Determine what factors are causing the patient's symptoms.
- Discuss how the evidence findings could affect your clinical practice and direct your treatment choices.
- Create an evidence-based treatment plan that employs a variety of strategies to assist the patient in reaching their overall functional objectives.

MODULES FOR SPECIFIC CONDITIONS/ SKILLS

OBJECTIVE

To enable students to deepen their understanding of patient for Cardiac Rehabilitation, covering assessment, treatment planning, functional exercise capacity, and home program.

1. Assessment and Evaluation

SCENARIO 1

A 68-year-old man who had a history of high blood pressure, diabetes, and cholesterol went through coronary artery bypass graft (CABG) surgery four weeks ago. He currently experiences weakness all over, is exhausted, and finds it harder to tolerate physical activity. He reports that he finds it difficult to walk long distances and is reluctant to exercise because he fears that he will experience chest pain or dyspnoea.

CLINICAL SKILLS

- Explain why the chosen instruments are most suitable for evaluating functional capacity and the Rate of Perceived Exertion.
- Utilize the findings to identify particular functional constraints and impairments.
- Discuss the implications of a decreased cardiovascular endurance, limited thoracic expansion and functional limitations.

2. Treatment Planning and Implementation:

SCENARIO 2

Present a case of a patient with reduced cardiovascular endurance, functional capacity

CLINICAL SKILLS

- Present a comprehensive treatment plan that integrates evidence-based interventions
- Explore the role of exercise prescription in aerobic exercise, strength training and breathing exercise and cardiac rehabilitation program
- Based on evidence, address the considerations for patient education, life style modification and stress management techniques in home exercise programs.

3. Individualized Exercise

SCENARIO 3

Plan an individualized treatment plan for the given patient post CABG.

CLINICAL SKILLS

- Create an exercise plan that focuses on improving flexibility, strength, and ability to self-manage symptoms.
- Include strategies for Progressive resistance exercise
- Discuss the use of various outcome measures based on the evidence.

BRONCHIECTASIS

OBJECTIVE

To enable students to deepen their understanding of Pulmonary rehabilitation, covering assessment, treatment, functional training, and management of respiratory condition complications.

MODULE 1: Respiratory Assessment

SCENARIO: A case study of a patient with Bronchiectasis

CLINICAL SKILLS

- Apply the detailed assessment for respiratory conditions including Inspection, Auscultation of lungs, Palpation, Percussion and activity evaluation.
- Interpret the above assessment and provide the provisional diagnosis

MODULE 2: Interpretation of PFT and ABG

CLINICAL SKILLS

- To know the normal values of lung volumes and capacities, the dynamic values, Various bedside PFT's, interpretation of the spirogram and ABG values.

MODULE 3: Problem List, Short Term and Long-Term Goals

CLINICAL SKILLS

- Formulate the problem list with activity limitation and participation restriction.
- Include various breathing strategies and be aware of their desired outcome, improve lung function, promote community participation and social integration.
- Incorporate airway clearance techniques manual and mechanical techniques.

MODULE 2: Assessment of a Patient with Bronchial Asthma

Scenario: A 28-year-old woman reports that, on several occasions, she has experienced coughing, tightness of chest, wheezing, and dyspnoea, especially at night and after exertion. She uses a short-acting beta-agonist (SABA) inhaler as needed meter.

Clinical Skill

- Carry out an exhaustive respiratory system assessment involving history and physical examination such as inspection, palpation, percussion and auscultation.
- Conduct and analyze the pulmonary function tests (PFTs) and the peak expiratory flow rate (PEFR).
- Evaluate the patient's asthma triggers and level of control using standard asthma control questionnaires.

Key components to be integrated in the history of patients for the assessment of the severity and control of asthma

Enumerate the clinical signs that you expect to elicit on physical examination in an acute asthma attack.

Peak flow monitoring in asthma: a measured approach to management as well as interpretation of the findings in relation to the patient's symptoms.

Which criteria among the diagnostic criteria for bronchial asthma would you select on the basis of the findings obtained on spirometry?

In your evaluation, how would you discriminate asthma from other diseases of the respiratory system, for example, chronic obstructive pulmonary disease (COPD)?

MODULE 2: Interpretation of Pulmonary Function Tests (PFTs) and Arterial Blood Gases (ABG)

Scenario: The patient undergoes spirometry, and the following results are obtained: FEV1 is 60% of predicted, FVC is 85% of predicted, and FEV1/FVC ratio is reduced. Post-bronchodilator, FEV1 increases by 15%.

Clinical Skills to be Assessed

Understand the normal values and ranges for PFTs and ABGs.

Interpret spirometry findings and the significance of bronchodilator reversibility in asthma diagnosis.

Determine the severity of an asthma attack by analysing ABG results.

Advanced Learning

How does the FEV1/FVC ratio help clinicians determine the presence of obstructive airways diseases such as asthma?

Taking into account the spirometry results, what level of asthma severity would one attribute to this patient and why?

How will you explain an increase in FEV1 post-bronchodilator for this patient?

What ABG values changes do you expect during an acute asthma attack, in mild, moderate and severe degree?

How would respiratory alkalosis be distinguished from respiratory acidosis in terms of asthma exacerbations?

MODULE 3: Management and Treatment Planning

Scenario: The patient reports that she uses her inhaler multiple times per week but has been waking up at night due to shortness of breath. She has been prescribed with an inhaled corticosteroid (ICS) but reports to poor adherence.

Clinical Skills to be Assessed

Come up with a solid and practical asthma management plan and make sure to back it with credible sources.

Combine pharmacological and non-pharmacological interventions that are suitable.

Specifically set SMART targets to effectively manage the asthma condition and for educating the patient on how to handle such conditions.

Develop strategies for interventions and review the treatment based on the feedback given by the patient.

Advanced Learning

How would you describe the above patient and classify her asthma based on what medications she is on and her symptoms?

What changes in your pharmacological approach would you make in order to help control her asthma better?

Explain how you would go about asthma management using the step wise approach as recommended by the guidelines, for example, the GINA guidelines.

Mention some of the non-pharmacological approaches that would have enabled this patient to manage her asthma symptoms better.

What instructions would you give the patient in regard to inhaler usage and taking the maintenance medication to help prevent the condition from becoming chronic?

MODULE 4: Airway Clearance Techniques and Breathing Strategies

Scenario: The patient presents with difficulty in expectorating excess secretions during an asthma attack. Even during mild activity she gets shortness of breath and is eager to know the strategies to overcome the symptoms during any acute exacerbation.

Clinical Skills to be Assessed

Demonstrate and teach appropriate airway clearance techniques for asthma.

Incorporate breathing strategies such as diaphragmatic breathing and pursed-lip breathing.

Evaluate the effectiveness of these interventions in improving lung function and reducing symptoms

Advanced Learning

Which manual and mechanical airway clearance techniques can be utilized to treat patients with asthma? What, therefore, do you stand to gain from them?

Describe the physiological mechanism and clinical usefulness of pursed-lip breathing in asthma treatment.

How might diaphragmatic breathing improve lung function in patients with asthma? Under what clinical conditions would you teach the patient?

When would you advocate use of a PEP device in asthma, and what outcomes would you anticipate?

What risks are there of overuse of airway clearance techniques in a patient's stable asthma?

What are the potential risks of overusing airway clearance techniques in a patient with stable asthma?

MODULE 5: Reassessment, Monitoring, and Long-Term Management

Scenario: At 4 weeks after instituting the treatment plan, the patient comes in for a follow-up appointment. The patient reports fewer episodes of asthma but night-time episodes are not stopped.

Clinical Skills to be Assessed

Conduct a follow-up assessment to evaluate the patient's response to treatment.

Reassess the lung function and asthma control using standardized tools.

Revise the treatment plan based on the patient's progress and reassessment findings.

Advanced Learning

What key clinical signs and symptoms would you assess during a follow-up visit to determine the patient's asthma control?

How would you use the Asthma Control Test (ACT) and other control questionnaires in determining the response of the patient to treatment?

What modifications would you make to the treatment plan if the patient continues reporting nocturnal symptoms despite improvement in control?

How frequently would a patient with well-controlled asthma have to undergo lung function tests and why is it important?

What are the preventive measures and improvement in the quality of life of the patient regarding long-term complications?

MODULE 6: Management of Acute Asthma Exacerbation

Scenario: The patient arrives at the clinic with increased shortness of breath, wheezing, and an inability to speak in full sentences. Her peak flow is 50% of predicted and provides no relief when using her inhaler.

Clinical Skills to be Assessed

Identify symptoms of a severe asthma exacerbation.

Start proper acute management, which would encompass pharmacological interventions and oxygen therapy.

Establish an action plan for the care of the patient in the event of an exacerbation in the future.

Case Scenario 2: Traumatic Pneumothorax

Scenario:

A 35-year-old male presents with rib fractures and pneumothorax after a motorcycle accident. An Intercostal draining has been inserted to drain air from the pleural space. The patient complains of pain, shallow breathing, and difficulty when trying to clear his sputum.

Physiotherapy Assessment:

Respiratory Assessment

- **Chest Wall Movement:** Observe and palpate for decreased chest wall movement on the side of the pneumothorax and rib fractures.
- **Auscultation:** Check for decreased breath sounds and the patient's effectiveness in clearing secretions.
- **Cough Assessment:** Assesses the patient's ability to generate an effective strong productive cough.
- **Pain Assessment:** Use a visual analogue scale (VAS) or numerical rating scale (NRS) to evaluate pain that would influence breathing patterns and cough effectiveness.
- **Functional Assessment:**
 - Assess the patient's mobility and activity tolerance (e.g., bed mobility, transfers, walking distance).
 - Identify any limitations in ADLs caused by pain and restricted breathing.

Physiotherapy Management

- Proficiency in teaching and implementing breathing techniques (e.g., diaphragmatic breathing, pursed-lip breathing) to manage dyspnea.
- Skill in performing basic chest physiotherapy techniques to assist with airway clearance, such as ACBT or cough facilitation.
- Ability to accompany exercises in functional mobility for instance, walking and seated exercise, and be able to monitor for onset of acute respiratory distress.
- Ability to prescribe a home exercise program.

Case Scenario: Emphysema

Scenario: A 62-year-old man with a history of smoking for 30 pack-years presents with increasing shortness of breath for a year. He was unable to do simple daily activities, such as climbing stairs and walking short distances, because of breathlessness. He had uninterrupted cough with most of it being a non-productive nature and a few bouts of wheezing. Chest X-ray reveals hyperinflation and pulmonary function tests confirm moderate emphysema. The patient is referred for physiotherapy as an attempt to help him overcome his symptoms and improve quality of life.

Assessment Objectives

- Assess the patient's respiratory function: Identify lung volumes, gas exchange, and breathing patterns affected by emphysema.
- Assess functional capacity: Estimate how emphysema affects the patient's ability to carry out daily activities and exercise tolerance.
- Identify activity limitations and participation restrictions: Assess how the patient's condition limits physical activity and quality of life.
- Evaluate the effectiveness of airway clearance techniques: Determine if retained sputum or airflow obstruction is potentially exacerbating the patient's symptoms.
- Evaluate the necessity to reposition: Examine chest wall mobility and postural compensations that may be associated with chronic lung disease.

Advanced Assessment Techniques

Pulmonary Function Tests (PFT)

- Review PFT results to determine the extent of airway obstruction and lung hyperinflation (such as decreased FEV1, increased residual volume).
- Review the peak expiratory flow rate (PEFR) as an index of expiratory strength of muscles and the level of airway obstruction.

Exercise Tolerance Testing

- Perform the 6-Minute Walk Test (6MWT) which will assess the patient's exercise capacity and de-saturation during activity.
- Assess perceived breathlessness and fatigue by using the Borg Scale.

Quality of Life Assessment

- Administer the St. George's Respiratory Questionnaire (SGRQ) to assess the impact of emphysema on the patient's overall health, daily life, and perceived well-being.

Postural Assessment

- Check posture for forward-leaning or kyphotic changes caused by chronic breathlessness and fatigue and utilize advanced equipment to analyze postures
- Intervention

Intervention Objectives

- **Optimize the Efficiency of Breathing:** Train in strategies that will decrease dyspnea and increase ventilation to the lung
- **Tolerance to Exercise:** Provide a graded exercise program with gradual progression to increase endurance, strength, and mobility.
- **Promote Effective Airway Clearance:** Use strategies to manage airflow limitation and clear secretions if present.

- **Optimize Quality of Life:** Develop strategies to improve the patient's ability to perform daily activities, maintain independence, and engage in social participation.
- **Prevent Complications:** Educate the patient on maintaining lung health and preventing exacerbations.

Intervention Techniques

- Implementation of various breathing techniques
- Introduction of mechanical aids to keep the airway open and aid in expectoration
- Implementation of personalized exercise program
- Means to prevent slumped or forward leaning postures that can exacerbate the condition of the lung
- Energy Conservation Techniques: rest and conserve energy when engaging in daily activities to reduce exhaustion and breathlessness.
- Implementation of assistive technology to aid in tasks that require prolonged effort
- Education and Self-Management, Patient education
- Design a home exercise program with instructions on how to progress the activity safely.

Clinical Reasoning Questions

- Found the program on the patient's baseline exercise tolerance, lung function, and oxygenation level.
- If the patient has weak coughing capacity, how will you modify your airway clearance techniques?
- Modify the airway clearance techniques by inclusion of huffing or use of a PEP device to facilitate sputum clearance without forceful coughing.
- Address postural deviations through postural education and exercises encouraging thoracic mobility and optimal chest wall expansion during breathing.

Case Scenario: Neonate with Respiratory Failure on BiPAP

Scenario: A preterm neonate (gestational age 32 weeks, birth weight 1.8 kg) who presented with respiratory failure. The baby now 10 days old and had been under Bi-level Positive Airway Pressure over the last 48 hours due to worsening respiratory function. The neonate has evidence of increased work of breathing that includes nasal flaring, grunting, intercostal retractions, and tachypnoea with a respiratory rate of 65 breaths per minute. The ABG results were raised to indicate mild hypercapnia and hypoxemia. The neonate was referred to physiotherapy for the purpose of enhancing lung function, to reduce the work of breathing and for overall recovery.

Assessment

Assessment Objectives

- Evaluate the neonate's respiratory status: Assess the work of breathing, lung expansion, and oxygenation status.

- Assess the effectiveness of the BiPAP support: Verify that non-invasive ventilation is adequately supporting gas exchange.
- Monitor chest wall movement and airway clearance: Establish whether or not there are secretions or restrictions in lung expansion contributing to respiratory failure.
- Identify signs of respiratory fatigue: Evaluate muscle effort, postural changes, and deconditioning associated with prolonged support for breathing.

Observation and Inspection

- Systemically observe and identify accurate signs of respiratory distress such as nasal flaring, grunting, intercostal retractions and tachypnea
- Check the saturation level of oxygen and identify any departure from the normal pattern such as cyanosis etc.
- Have the ability to observe the overall appearance of the neonate, posture, and accessory muscle use of the neonate.

Palpation

- Have the ability to palpate chest wall for symmetrical lung expansion.
- Detecting alteration in tactile fremitus which might indicate consolidation or collapse of the lungs.
- Handle the fragile neonate carefully while you palpate it.

Auscultation

- Accurate breath sounds (crackles, wheeze, decreased airflow)
- Relate auscultation findings to potential retained secretions or atelectasis
- Interpretation of ABG and X-ray Results:
- Ability to comprehend ABG values in terms of oxygenation (PaO₂), ventilation (PaCO₂), and acid-base balance (pH)
- Examine chest X-rays and interpret lung abnormalities, which can include atelectasis, hyperinflation, or fluid level

Posture and Muscle Fatigue Assessment

- Skill in assessing for postural issues related to respiratory effort (e.g., head bobbing, abdominal breathing).

Outcome Goals

Devise an appropriate management plan for the patient, addressing the following: Improvement of Lung Expansion, Enhancement of Oxygenation, Decreased Work of Breathing, and Prevention of Complications.

Case Scenario: Pulmonary Rehabilitation (Phase I)

Scenario:

A 65-year-old male patient is referred to Phase I of pulmonary rehabilitation following a hospital admission for an acute exacerbation of chronic obstructive pulmonary disease. The patient has smoked for 40 years, which has caused emphysema at moderate levels. He was recently hospitalized two times over the course of the last year due to the exacerbations. In the present hospitalization, he had to be started on oxygen therapy and has been on supplemental oxygen for the last week. He describes shortness of breath on minimal exertion, such as walking short distances. There is a productive cough and generalized fatigue. He remains stable and ready for early rehabilitation to improve functional capacity and to reduce breathlessness.

Practical Tasks for the Student

Initial Assessment

- Careful subjective examination should involve history of symptoms, a history of COPD, and medications as well as lifestyle.

Perform a physical assessment including

- Rate of breathing, pattern, and accessory muscle use.
- Assessment through measurement of chest expansion to describe the degree of lung expansion.
- Auscultation to assess breath sounds and listen for wheezing, crackles, or diminished breath sounds
- Oxygen saturation monitor at rest and minimal activity to determine the requirement for supplemental oxygen.
- Observe for any change due to a longstanding problem that has caused difficulty in respiration, by postural assessment.

Functional Capacity Testing

- Perform a 6-Minute Walk Test (6MWT) or its modified version, with oxygen saturation, heart rate and level of dyspnea monitored.
- Basic functional tasks assess muscle strength in the lower limbs and endurance, for example, sit-to-stand test.

Intervention Plan

- Develop an individualized exercise programme that includes early mobility, retraining of breathing and light endurance exercises tailored to the patient's current tolerance- for example, walking or seated exercises.
- Educate patient on breathing techniques to minimize breathlessness when she is exerting, such as pursed-lip breathing and diaphragmatic breathing.

- Institute chest physiotherapy techniques to aid in airway clearance, such as active cycle of breathing techniques (ACBT) or assisted coughing if productive cough persists.

Patient Education

- Teach the patient about pulmonary rehabilitation and why stable exercise may help manage COPD.
- Teach them how to use supplemental oxygen appropriately when exercising.
- Teach strategies for energy conservation during everyday activities to promote decreases in fatigue and dyspnea.

Monitoring and Progression

- Maintain monitoring of oxygen saturation and adjust activity to prevent desaturation.
- Gradual progression of exercise intensity with caution: Over exertion should be completely avoided.
- Monitor the patient's response to any given intervention and may require adjustment in the rehabilitation plans.

Skills to Be Assessed

Assessment Skills

- Can undertake comprehensive subjective and objective assessment for a patient with COPD, including gathering an individual history, direct observation of respiratory mechanics, and auscultation.
- Vital signs monitoring: respiratory rate, oxygen saturation, heart rate and to be able to give an interpretation of the findings for ensuring safety of patients.
- Ability to assess thoracic expansion and chest measurements
- Ability to assess functional capacity 6MWT or equivalent and to interpret the results in the framework of the patient's overall condition.

Clinical Reasoning

- Able to design an individualized care plan based on an appropriate assessment that includes exercise prescription and breathing strategy.
- Demonstrates appropriate clinical judgment in selection of exercises and interventions appropriate for the patient's tolerance and goals in Phase I rehabilitation.
- Recognizes the potential for desaturation or overexertion in a patient with COPD and modifies interventions accordingly to assure the patient's safety.

Intervention Techniques

- Ability to teach and demonstrate breathing exercises, such as diaphragmatic breathing, pursed-lip breathing, to aid the patient experiencing dyspnea.

- Skill in teaching basic chest physiotherapy technique to enhance airway clearance techniques, such as ACBT or cough facilitation.
- Ability to oversee functional mobility activities, such as ambulation or seated exercises, and monitor for signs of respiratory distress.

Patient Education

- Having effective communication skills to inform the patient on the importance of pulmonary rehabilitation, exercise, breathing strategies, and oxygen use.
- Able to teach self-management skill to the patient such as energy conservation and how to do exercises at home.

Monitoring and Adaptation

- Oxygen saturation monitoring when the activity is done; it should be kept within limits when doing activity.
- Recognize signs of respiratory fatigue or decompensation and changes the program appropriately.
- Document progress accurately, as well as a modification of the exercise plan based on the patient's response.

Key Outcomes for the Student

- Perform a comprehensive respiratory and functional evaluation on a patient during Phase I pulmonary rehabilitation.
- Build an individualized, appropriate intervention plan for exercise, breathing technique training, and education.
- Be able to make safe and effective clinical decisions about the advancement or alteration of interventions based on the patient's response.
- Deliver patient-centered education for ongoing self-management and home-based exercise at the time of discharge

PRACTICAL MODULES IN COMMUNITY PHYSIOTHERAPY

Requisite Skills Set in Community Physiotherapy

- Knowledge: Understanding of health conditions and basic diagnostic skills.
- General Clinical skills: Assessment, needs identification, goal setting, educating person with disabilities and their families, intervention to address inclusion barriers, assistive devices need assessment and prescription, rehabilitative approaches to make patient functionally independent.
- Communication skills: health promotion, advocacy, collaboration and mobilising communities.

Module 1: Assessment

1. Conduct the need identification to start rehabilitation services in given geographical area. (quantitative and qualitative study through focus group discussion on current needs of physiotherapy services based on CBR matrix)

Skills to Demonstrate

- Planning focused group discussion specific to the need to be assessed.
 - Interpretation and Implementation.
2. Draw clinical care pathway in geriatric rehabilitation at tertiary care hospital. (Align with 7 step model of care pathway)
 3. Develop the self-help group and mobilize young adults to improve their lifestyle and present 3 months report.

(Steps in community mobilization: identify the problem and resources available, strengthen the community organizations, create environment to address the problem and participation)

4. Conduct early identification and follow up for developmental delay among high-risk infants. (Asses all the domains of development using valid, reliable and feasible tool for screening and diagnosis of developmental delay in rural community set up)

Skills to Demonstrate

- Choose appropriate assessment tool for early identification of disabilities
 - Interpretate the results.
 - Present the importance of screening, diagnosis and follow-up of the cases.
5. Conduct the survey to assess the need of assistive technology among person with disabilities. (Survey tool: rapid assistive technology tool)

Skills to demonstrate:

- Interpersonal skills
 - Communication skills
 - Project management
 - Adaptability
6. Assess the perceived environmental barriers for wheelchair user at tertiary care hospital using assessment tool. (tool e.g.: craig hospital inventory of environmental factors)
 7. Conduct the educational training sessions for Anganwadi workers on early identification of disabilities using appropriate screening tool in the community setup.

Skills to demonstrate:

- Designing high quality evidence-based health education program.
 - Use of educational technology for training.
 - Determining the style of learning and construct the educational program accordingly.
 - Communication skills.
 - Motivational skills.
8. 45-year-old female residing in rural community, diagnosed with leprosy 10 years ago, completed MDT. Patient complains of loss of sensation in fingers and toes, presenting hand and foot deformities and difficulty in performing activities of daily living.

Assessment Objectives

- Discuss diagnostic criteria.
- Conduct sensory examination and physical examination for impairments.
- Assess for the need of assistive devices
- Use outcome measure tool: eye hand feet scoring, SALSA score
- Assess mental well being and quality of life.

Intervention Objective

- Develop strategies for psychosocial support to address mental health and group therapy with leprosy affected individuals for social support.
 - Discuss the strategies to create awareness and educate about leprosy in rural community setup, in order to reduce social stigma.
 - Develop evidence based therapeutic approaches aligned with clinical findings.
 - Prescription of assistive devices and footwear for self-care and justify with clinical findings.
 - Present recent advancements on technology which aids to live independently.
 - Present the existing national policies and need for the change in the policy.
9. 34-year-old male warehouse worker, with H/O right above knee amputation six months ago. No significant comorbidities.
Stump: healing no signs of infection
Pain assessment: phantom limb pain

Assessment Objective

- Evaluate disability percentage.
- Conduct pre prosthetic evaluation: physical assessment, functional assessment, psychological evaluation.
- Use work capacity evaluation tool to assess patients' ability to perform his job duties.

Intervention Objectives

- Coping strategies for patient to adjust to amputation.
- Structure rehabilitation protocol to adapt activities of daily living and live independently.
- Outline vocational training based on work capacity evaluation.
- State the policies and benefits for person with disability

Practical Module on Ergonomic

Requisite Skills Set in Ergonomic

- Knowledge on anatomy and workplace environment
- Analytical reasoning
- Creativity and reasoning

1. A worker lifts a 15 kg load from loosely piled pieces of metal from the floor to the table six times an hour.

Given that: H- 32cm

V-1cm

D-110cm

F-15min

A-0 degree

C- poor

Calculate the recommended weight limit for the task and recommend the necessary modification at work place.

2. Evaluate musculoskeletal disorders risk associated with job task for both upper and lower body. Recommend feasible redesigning of workplace for client in order to better functioning at workplace.

Discuss on the recent evidence for the same.

(Use appropriate assessment tool)

3. Evaluate musculoskeletal disorders risk associated with job task for upper body. Recommend feasible redesigning of workplace for client in order to better functioning at workplace.

Discuss on the recent evidence for the same.

(Use appropriate assessment tool)

4. 34-year-old female, working in a manufacturing company at automotive parts production unit. C/O repetitive strain injuries leading to increased absenteeism and decreased productivity.

Assessment objective

- To minimize RSI
- To improve employee engagement and skill development
- Analyse production output before and after implementation of job rotation

Practical Module on Women's Health

1. 41-year-old female, obese and experiences urinary incontinence for the past 3 years. Patient reports that urinary incontinence manifests as leakage during sneezing, coughing and lifting heavy weights and also sudden urge to void the urine occasionally drips before reaching the washroom. Due to fear of leak and embarrassment patient started avoiding engaging in social gatherings.

Assessment Objective

- Conduct a comprehensive assessment
- Analyse the diagnosis and identify the risk factors
- Assess core and pelvic floor muscle strength
- Identify the impact on quality of life

Intervention Objective

- Educate the patient on lifestyle modifications
- Develop individualised exercise program
- Implement the strategies to improve the quality of life of patient

2. A 62-year-old female patient came with the complaint of occasional back pain, with increased susceptible to fractures (recent wrist fracture after fall) and noticed height difference (reduced) and kyphosis. On investigation: Bone density T-score -2.5, Vitamin D 15ng/ml, TFT normal, serum calcium normal.

Assessment Objectives

- Give diagnosis and provide justification
- State the early intervention strategies to prevent the condition
- Outline comprehensive management

Intervention Objective

- Design & demonstrate a comprehensive evidence-based treatment plan aligning with the clinical findings.
- Comment on the recent advances in PT interventions.

3. 28-year-old female with healthy pregnancy, delivered healthy baby via vaginal birth 5 months ago. Patient came with the complaint of persistent low back pain, mild discomfort in shoulders and neck while breastfeeding and difficulty in performing activities of daily living.

Assessment Objectives

- Conduct assessment with appropriate tool for diagnosis
- Justify the clinical findings
- Assess posture, core and pelvic floor muscle strength
- Determine the impact on quality of life of mother.

Intervention Objective

- Educate mother on breastfeeding and baby handling techniques.
- Develop the structured evidenced based exercise program to address the clinical findings.
- Plan self – management strategies to maintain the progress.

4. 26-year-old nulliparous women, occupation competitive soccer player came with the complaint of episodes of urinary incontinence during high impact activities. Leaked experience 1-2 times per week during practice and games.

Assessment Objectives

- Conduct comprehensive physical examination
- Suggest diagnostic test and justify the clinical findings
- Conduct functional movement screening: dynamic movements, balance and stability test

Intervention Objectives

- Educate patient and provide guidance on proper techniques during training to minimize impact on pelvic floor.
 - Structure evidence-based physical therapy approaches to address clinical findings.
 - Suggest low-impact training activities and provide strategies to gradually reintroduce high impact activities.
 - Critically analyse the relationship between core stability and pelvic support during high impact activities.
5. 31-year-old postpartum women, 3 months after normal vaginal delivery mother noticed a gap between abdominal muscles and bulging of abdomen. Patient also complains of low back pain and difficulty in performing activities of daily living.

Assessment Objective

- Conduct the physical examination and justify the clinical findings.
- Correlate the findings with core strength and pelvic floor dysfunction.

Intervention Objectives

- Educate the patient
- Structure evidence-based physical therapy approaches to address clinical findings.

Evidence-Based Assessment Methods

Introduction

Evidence-based assessment methods ensure that physiotherapy students are assessed with standard methods aligning with current best practices. These methods provide a reliable and valid assessment of students' practical skills, ensuring they are competent to provide high-quality patient care.

Types of Assessment Components of Assessment

Objective Structured Clinical Examinations Students perform specific clinical tasks under controlled conditions, in standardized stations.

Each station has a checklist that provides the expected performance criteria
Perform reliability and validity tests, to minimize rater bias and for consistent evaluation across students.

Mini-Clinical Evaluation Exercises (MECEs)

Short scenarios are presented, to assess clinical reasoning and decision-making abilities, in a specific area.

Students are rated on their performance using a standardized rating scale.

Case-Based Discussions Students discuss clinical cases in small groups, analyzing the patient's history, examination findings, diagnosis, and treatment plan.

Students evaluate each other's contributions to the discussion through Peer assessment.

Case-based discussions assess students' communication skills, critical thinking abilities, and ability to integrate knowledge from various sources.

Direct Observation

Students' performance are observed and assessed in real-world clinical settings.

During observation checklists guide the assessment process and ensure consistency & authenticity.

OSCE Practical Skills Assessment Tool

This tool evaluates students based on clinical reasoning, practical skills and professionalism. These criteria can be adjusted depending on specific practical tasks.

Station/Skill Being Assessed: Gait Analysis, Exercise Prescription, Fall Prevention in Elderly, etc.

Components of Station Skills

Initial Assessment & Clinical Reasoning (15%) History Taking: Did the student gather a comprehensive patient history?

Clinical Assessment: Did the student select and perform appropriate physical assessments?

Problem Identification: Did the student identify key clinical issues (e.g., range of motion deficits, gait abnormalities)?

Treatment Planning & Execution (30%)

Treatment Choice: Were the treatment techniques appropriate for the patient's condition (e.g., manual therapy, exercise prescription, etc.)?

Skill Execution: Was the treatment executed correctly (e.g., positioning, handling, dosage)?

Modification of Treatment: Was the student able to adapt the treatment based on patient response

Communication & Patient Interaction (20%) Clarity of Instructions: Did the student explain the procedures clearly to the patient?

Professionalism: Was the student respectful and professional in interactions?

Patient Engagement: Did the student involve the patient in decision-making and provide clear information about the treatment plan?

Safety & Ethical Considerations (15%)

Patient Safety: Did the student prioritize patient safety throughout the assessment and treatment (e.g., safe handling, correct technique)

Infection Control: Did the student adhere to appropriate infection control protocols?

Ethical Practice: Was the student aware of ethical considerations (e.g., consent, patient privacy)?

Reflective Practice & use of Feedback (20%)

Self-Reflection: Did the student reflect on their own performance and identify areas for improvement?

Feedback Response: Did the student accept feedback and adapt their approach?

Clinical Reasoning Adjustment: Did the student demonstrate improvement in clinical reasoning after feedback?

Assessment criteria for each component -Poor (0), Fair (1), Good (2), Excellent (3)
Calculate total for each section

Overall Comments:

Total Score: /45

Grading Scale:

- Excellent: 41-45
- Good: 35-40
- Fair: 28-34
- Needs Improvement: Below 28

Mini Clinical Evaluation exercise

Scenario: A 45-year-old patient presents with hemiparesis following a stroke.

Tasks Skills to be assessed Assessment Criteria
Assess motor function

Evaluate muscle strength in the affected upper and lower extremities.

Assess Joint Range of Motion

Assess Balance and Coordination Knowledge: Demonstrates understanding of neurological anatomy, physiology, and pathology.

Clinical Reasoning: Accurately assesses motor function and identifies functional limitations.

Problem-solving: Develops a comprehensive and appropriate treatment plan.

Communication: Communicates effectively and articulates ideas clearly.

Professionalism: Demonstrates professionalism and ethical behavior.

Identify Functional Limitations

Observe the patient's ability to perform activities of daily living (ADLs), such as dressing, grooming, and eating.

Identify specific functional limitations that are impacting the patient's quality of life.

Develop a Treatment Plan

Outline a personalized treatment plan based on the patient's assessment findings.

Include specific goals related to improving motor function, functional independence, and quality of life.

Propose appropriate interventions, such as therapeutic exercises, neuromuscular re-education, and assistive devices.

Considerations

- Ensure that MECEs are standardized to minimize rater bias and ensure consistency across students.
- Design MECEs to reflect real-world clinical scenarios.
- Ensure that the MECE tasks are relevant to the specific area of neurological physiotherapy being assessed.
- Adjust the level of difficulty of the MECE to match the students' knowledge and skills.

Case-Based Discussion

Case: A 5-year-old cerebral palsy child.

Discussion Topics

Skills domain Skills to be assessed Assessment Criteria

History

Obtain Prenatal and perinatal history. Discuss any associated risk factors in the given clinical condition, such as premature birth, low birth weight, or infections during pregnancy.

Discuss the child's developmental milestones and any delays or deviations.

Discuss the child's current symptoms, including cognitive, communication difficulties, motor impairments, sensory impairments, and functional limitations

Knowledge: Demonstrates understanding of pediatric neurology, developmental principles, and therapeutic interventions.

Clinical Reasoning: Accurately analyzes the child's case and applies appropriate clinical reasoning.

Communication: Communicates effectively and articulates ideas clearly.

Critical Thinking: Evaluates different perspectives and makes informed decisions.

Professionalism: Demonstrates professionalism and ethical behavior.

Assessment Discuss the assessment of child's motor function, including muscle tone, reflexes, gross motor skills and milestones examinations.

Discuss the examination of child's sensory function, including vision, hearing, and tactile sensation.

Discuss the assessment of child's functional limitations in activities of daily living (ADLs), such as dressing, feeding, and mobility with appropriate scale.

Diagnosis Discuss how the diagnosis of cerebral palsy was arrived and the classification of the child's type (spastic, athetoid, or mixed).

Discuss the potential causes and underlying mechanisms of cerebral palsy to facilitate clinical reasoning.

Treatment Discuss appropriate evidence based treatment interventions for the child, including physical therapy, occupational therapy, speech therapy, and assistive technology, considering the global feasibility.

Discuss the goals of treatment with parents/ care takers and how they align with the child's individual needs and abilities.

Discuss the importance & need of family involvement and education in the treatment process.

Prognosis Discuss the child's prognosis and potential outcomes based on the clinical evaluation and disease severity.

Discuss the factors that may influence the child's prognosis, such as the availability of early intervention services, and family support.

Case-based discussion methods provide a comprehensive framework for assessing physiotherapy students' knowledge, clinical reasoning, communication skills, and professionalism.

Direct Observation of Performance Skills

Scenario: A physiotherapy student is examining and treating a patient with chronic low back ache.

Observation Areas Skills to be observed

Patient-Cantered Communication Observe whether the student establish rapport with the client?

Does the student actively listen to the patient's concerns and questions?

Does the student explain procedures and treatment plans clearly and effectively?

Does the student demonstrate empathy and compassion towards the patient?

Physical Examination Does the student conduct required physical examination, including inspection, palpation, motor, sensory and special tests?

Does the student accurately identify any abnormalities or impairments?

Does the student use appropriate examination techniques and equipment?

Clinical Reasoning

Does the student accurately diagnose the patient's condition based on the assessment findings?

Does the student develop a comprehensive and appropriate treatment plan?

Does the student justify their treatment decisions with evidence-based reasoning?

Intervention Techniques Does the student perform manual therapy / relevant evidence based techniques correctly and effectively?

Does the student apply electrotherapy modalities appropriately and safely?

Does the student design and implement appropriate exercise programs?

Documentation

Does the student document the patient's assessment findings, treatment plan, and progress notes accurately and comprehensively?

Does the student use appropriate medical terminology and documentation standards & obtained consent?

Scoring

- Each observation domain is rated on a scale of 1-5, with 5 being the highest score.
- The overall assessment is based on the average score across all observation areas.

Feedback

- Provide specific feedback on the student's performance, highlighting areas of strength and areas for improvement.
- Offer suggestions for further development and learning..

By incorporating direct observation into physiotherapy programs, educators can assess students' clinical skills in a real-world setting and provide valuable feedback for improvement.

Key Considerations for Evidence-Based Assessment

- **Validity:** Ensure that the assessment methods measure what they are intended to measure.
- **Reliability:** Ensure that the assessments are consistent and produce reliable results.
- **Fairness:** Ensure that all students have an equal opportunity to demonstrate their knowledge and skills.
- **Authenticity:** Use assessment methods that reflect real-world clinical practice.
- **Feedback:** Provide timely and constructive feedback to students to support their learning and development.